University of Bahrain
College of Information Technology
Department of Computer Science
First Semester, 2014-2015
Computer Programming for Scientists and Engineers

SERIAL
[redacted]

CSC 103
TEST II

Date: 3rd December 2014 | Time: 11:00 - 12:30

STUDENT NAME	[redacted]
STUDENT ID #	[redacted]

QUESTION #	MARKS		COMMENTS
1	10	10	
2	10	10	
3	10	9.5	
4	10	10	
TOTAL	40	39.5	

NOTE: THERE ARE SIX (6) PAGES IN THIS TEST
ONLY ONE SOLUTION WILL BE CONSIDERED FOR EACH QUESTION
WRITE YOUR ANSWERS CLEARLY
LAST PAGE IS EMPTY

Question 1 **(10 points)**

Show the output of each code in the corresponding box to the right.

(1)
```
int    x = 10, y = 7, z = 3;
if ( x-y == 0 )
   cout<<"Zero\n";
else
   cout<<"Positive\n";
cout<<"Value= " << z << endl;
```

Positive
Value= 3

10

(2)
```
int   i = 5;
while ( i != 2 ) {
    cout << i ;
    cout<<"+";
    --i;
}
cout<<endl<<"Done";
```

5+4+3+
Done

(3)
```
int x = 4, y = 5, z = -3;
if ( x < y || y > z)
   cout << x << endl;
if (x < 6 && y > -9 ){
   cout << z << '\t' << x+z << endl;
   cout << x + y << endl ;
}
else if ( z != 2 ) {
      cout << z << endl;
}
cout <<"Finished"<< endl;
```

4
-3 1
9
Finished

(4)
```
int j, k;
for (j=2 ; j <= 4 ; j++)
{
   for (k=2 ; k >0 ; k--)
      cout <<"*" << j;
   cout << endl ;
}
```

*2*2
*3*3
*4*4

Question 2 **(10 points)**

Write a C++ program that prompts the user to enter from the keyboard one character ***ch*** and three double values: ***v***, ***a***, and ***t***. Your program should calculate and print in a proper format the value of velocity according to the value of ***ch***.

$$velocity = \begin{cases} v + a \times t & if\ ch =' G' or\ 'g' \\ 2 \times a \times t & if\ ch =' D' or\ 'd' \\ Error: undefined\ symbol & if\ ch = other\ symbol \end{cases}$$

```
#include<iostream>

using namespace std;
int main()
{
 char ch;
 double v,a,t,vf;
 cout<<"Enter one character and three values (ch, v a t):"<<endl;
 cin>> ch >> v >>a >> t;
  switch(ch)
  {
   case 'G': case 'g':
      vf = v+a*t; cout<<"The velocity is:"<<v+a*t<<endl;
      break;
   case 'D': case 'd':
      vf = 2*a*t; cout <<"The velocity is:"<<2*a*t<<endl;
      break;
   default:
      cout<<"Error: undefined symbol" <<endl;
  }
 return 0;
}
```

10

Question 3 **(10 points)**

A triathlon is a multiple stage sports competition, where athletes compete for fastest overall course completion time. Write a C++ program that asks the user to enter the <u>name</u> and <u>time</u> for **50** athletes, then prints the name and time of the winner. All times are measured in minutes. The winner has the lowest time.

```
#include<iostream>
#include <string>

using namespace std;

int main ()
{
 string n, nw;
 int m, c=1, min=9999;
 cout<<"Enter name and time:"<<endl;
 cin>>n>>m;
 while(c<=50)
 {
  if (m<min){
   min=m;
   nw=n;
  }
  cout<<"Enter name and time:"<<endl;
   cin>>n>>m;
   c++;
 }
 cout<<"The winner is "<<nw<<"with time "<<min<<"minutes"
                                            <<endl;

return0;
}
```

9.5

-0.5

min = m;

Question 4 **(10 points)**

A restaurant distributes a form to his customers to get their feedback on the food quality and the services. The customers have to rate the restaurant by assigning a number between 0 and 100. The rates have been stored in a file named ***rates.txt.*** The restaurant manager wants to know the percentage of the satisfied customers.

Write a C++ program to do the following:

- Read unknown number of customer rating (**int**) stored in the file ***rates.txt***
- Count the number of customers with rating **0-100** (Do not count *negative* numbers or numbers greater than 100). C1 Total
- Count the number of satisfied customers with rating in the range **60 – 100**. C2
- Calculate and print a proper message of the percentage (float) of the satisfied customers.

```
#include <iostream>
#include <fstream>

using namespace std;

int main()
{
    ifstream inf;
    inf.open("rates.txt");
    int r, t=0, s=0; double p;
    inf >> r;
    while(inf)
    {
      if (r>=0 && r<=100)
      {
        t++;
      }
      if (r>=60 && r<=60)
      {
        s++;
      }
    }
    inf >> r;
  }
  p = ((static_cast<double>(s))/t)*100;
  cout << "The percentage of satisfied customers are: << p << "%" << endl;
  return 0;
}
```